WinPilot for iOS

User's Manual

June 2015

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Installation

When purchasing the application from Apple AppStore, the store will make the app ready to use.
After the app is up and running, it can be customized by adding additional files, like Polars, Airspace files, Turnpoint files and Satellite and Terrain Tiles. All files can be imported by sending an email message to the iOS device, and clicking on the attachment.

External Hardware

Butterfly Vario

Starting with version 1.63 WinPilot for iOS can connect to a Butterfly Vario equipped with a WiFi Dongle.
With this connection, WinPilot can receive GPS positioning data, Flarm Target data (up to 100 simultaneous targets), and McCready setting, Vario, TAS, Wind speed and direction.
Below are the steps to configure this connection.

Setting Up the Butterfly Vario:

- Power on Butterfly Vario

- Go to *Menu* then *Setup* then *Device*, *Peripherals*, and set *WiFi* to *Yes*

- Go to *Menu* then *Setup*, *Device* and GPS On, Flarm On, and LXWP On

Setting Up your iPad or iPhone:

- Power on Butterfly Vario

- Open the iOS®-Settings App on your iOS Device.

- Go to *Wi-Fi* and make sure WiFi is active.

- In the *Choose a Network..*-field the Network of your Butterfly Vario appears. It is always named *Butterfly Vario* followed by a multi-digit number code.

- Tap on the *Butterfly Vario*-Network to establish a connection

- Tap on the little blue arrow next to the *Butterfly Vario*-Network

- In the field *IP-Address* choose *Static*
- Enter the following IP-Address in the field *IP-Address*: ***192.168.1.2***

- Enter the following Subnet-Mask in the field *Subnet-Mask*: ***255.255.255.0***

Setting Up WinPilot:

- Before starting WinPilot, make sure that your iOS device is connected to the Butterfly_Vario WiFi network.
- Start WinPilot, go to Settings.Other.External Hardware and slide the 'Butterfly Vario' switch to ON.
- If WinPilot connects to the data stream coming from Butterfly, this switch will stay ON. If for some reason WinPilot cannot connect, then this switch will turn OFF, and an error message will be displayed. In this case WinPilot will fall back automatically on the internal GPS.
- While WinPilot is connected to the Butterfly vario, there is an indication on the main map screen, which is a small red butterfly symbol placed on the arrow showing North.
- While Butterfly is on, the main Settings page in the section dedicated to Wind, will have one more option in addition to regular 'Auto' and 'Manual', which is 'Butterfly'. This gives the pilot an option to either enter the Wind manually 'Manual', use wind calculated by WinPilot 'Auto', or use winds calculated by the Butterfly vario 'Butterfly'.

Transferring files in and out of WinPilot

Using email

Smaller files like polars, airspace and waypoint can be transferred into WinPilot by including them in an email attachment, and emailing them to your iOS device. Then, clicking on this attachment and selecting WinPilot as the program which should open it, will import the file into WinPilot. Use Settings.Polar to see your new polar file, and Settings.Files to see all the other newly imported files.

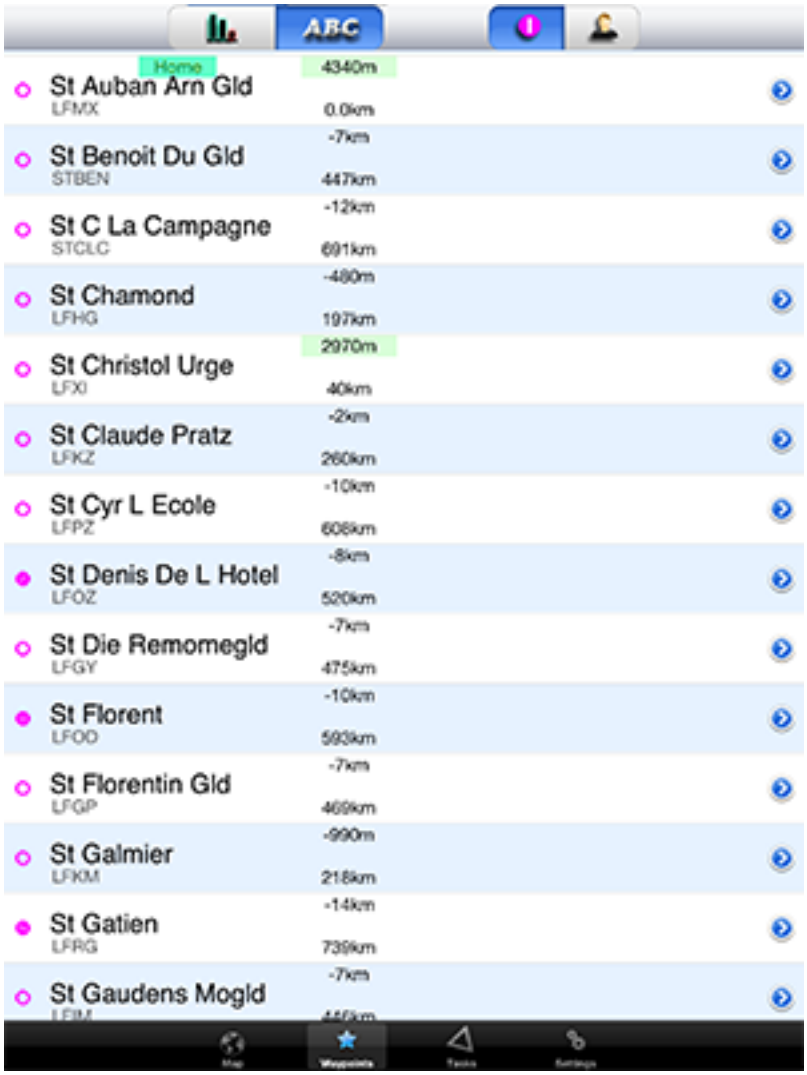
It is also possible to send the files to another user using email. Go into Settings.Files, and select the file to be emailed. Then select Email File to email out a Flight Log, Waypoint File, or an Airspace File.

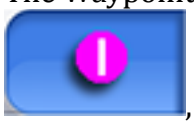
Using iTunes

Start iTunes App on your desktop, select your iOS device, click Applications and then WinPilot. You will get a window with all files on your iOS device (see the screen shot below). From there, you can drag and drop files in and out of the device. Note that we have changed the extension of OpenAir SUA files on iOS version from .txt to .air, to make it easier to differentiate SUA files from regular text files.

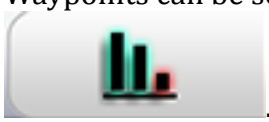
The Main Four Pages

The Waypoints Page

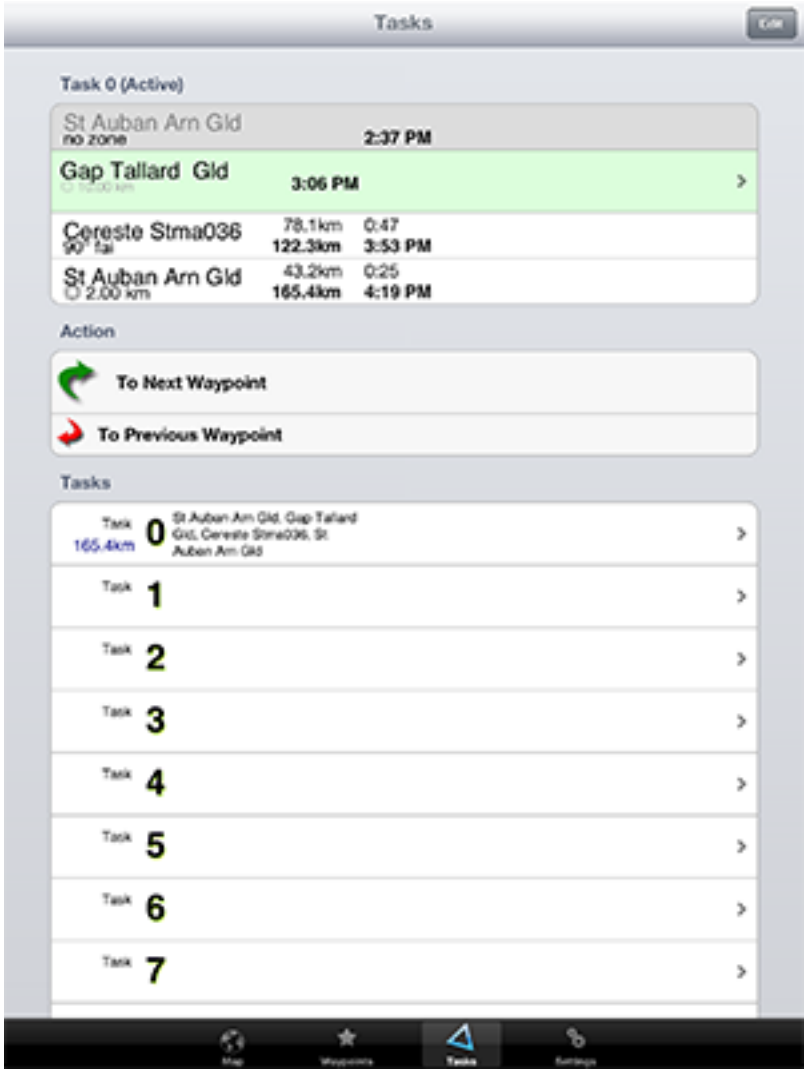


The Waypoints page shows either airports that are built into the program:  , or user waypoints imported by the user:

Waypoints can be sorted either by Name:

, or by arrival altitude:  . User Waypoints can be added as a text file in the Cambridge .dat formt (See the Appendix for the format description).

The Task Page

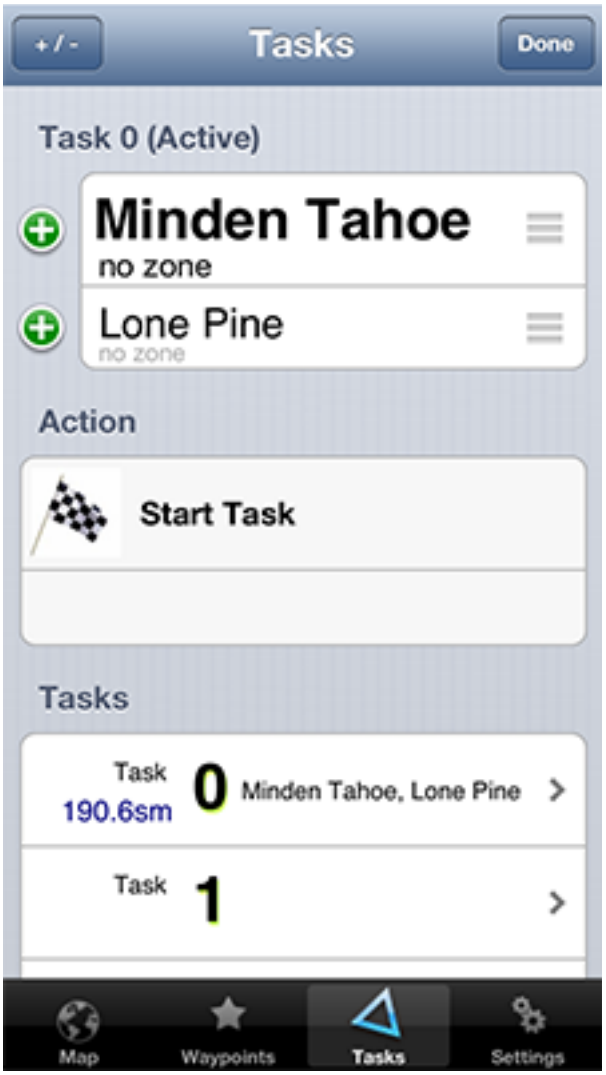


The Task Page contains memory for 24 tasks. **Task 0 is always the active task** being shown on the map, flown, and edited.
Any task can be copied into Task 0 by clicking the row with that task, and then selecting Activate. Task 0 can be copied into any other task by selecting the row with Task 0, and choosing Copy from the Menu.

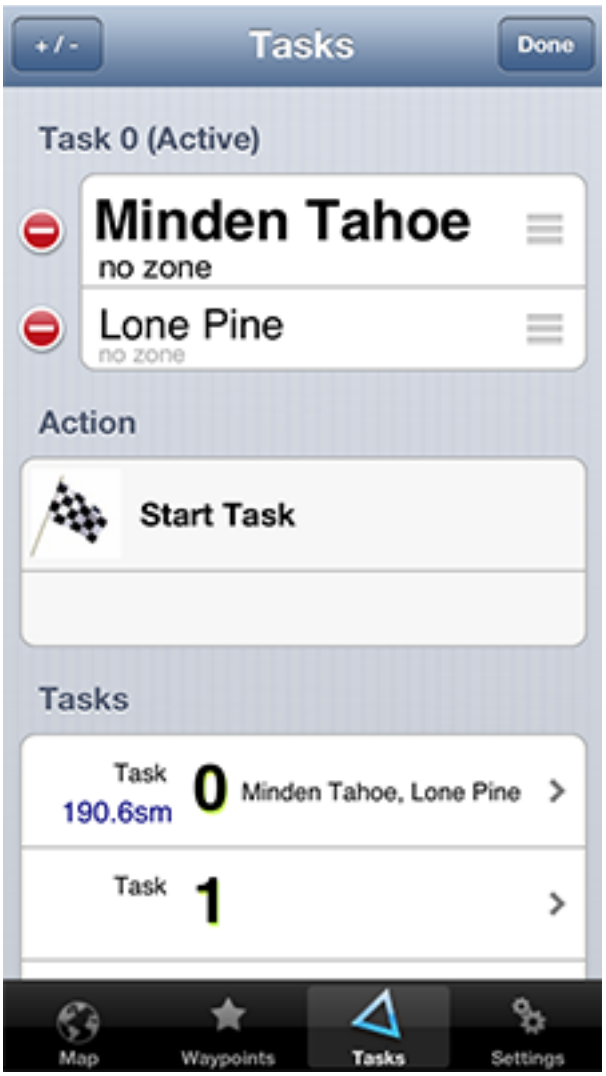
Tasks can be created/edited in two ways:
- From the Waypoints page - by selecting a waypoint and pressing 'Add To Task 0' menu option, and
- From the Task Page, by first pressing the Insert Waypoint to add the first waypoint, and then pressing the green Plus next to the slot in the task where the next waypoint should go in. After the task has been created, it then can by edited by pressing the Edit button in the upper right corner.

The Task Edit page can be in one of two modes: Insert Mode, or Delete mode.

Task Page in the Insert Mode



Task Page in the Delete Mode



To switch between Insert and Delete Modes press the **+/-** button in the upper left corner of the screen.

When using Tile Map style, the Task Page also allows downloading map tiles before the flight by selecting the '**Download Map Tiles**' menu, or deleting tiles for a given task (for example to make room for tiles for another task) by selecting 'Delete Map Tiles' menu item.

Another option that can be enabled on this page is 'Auto Zoom' that allows zooming in the map when near by a task waypoint.

Task Editing

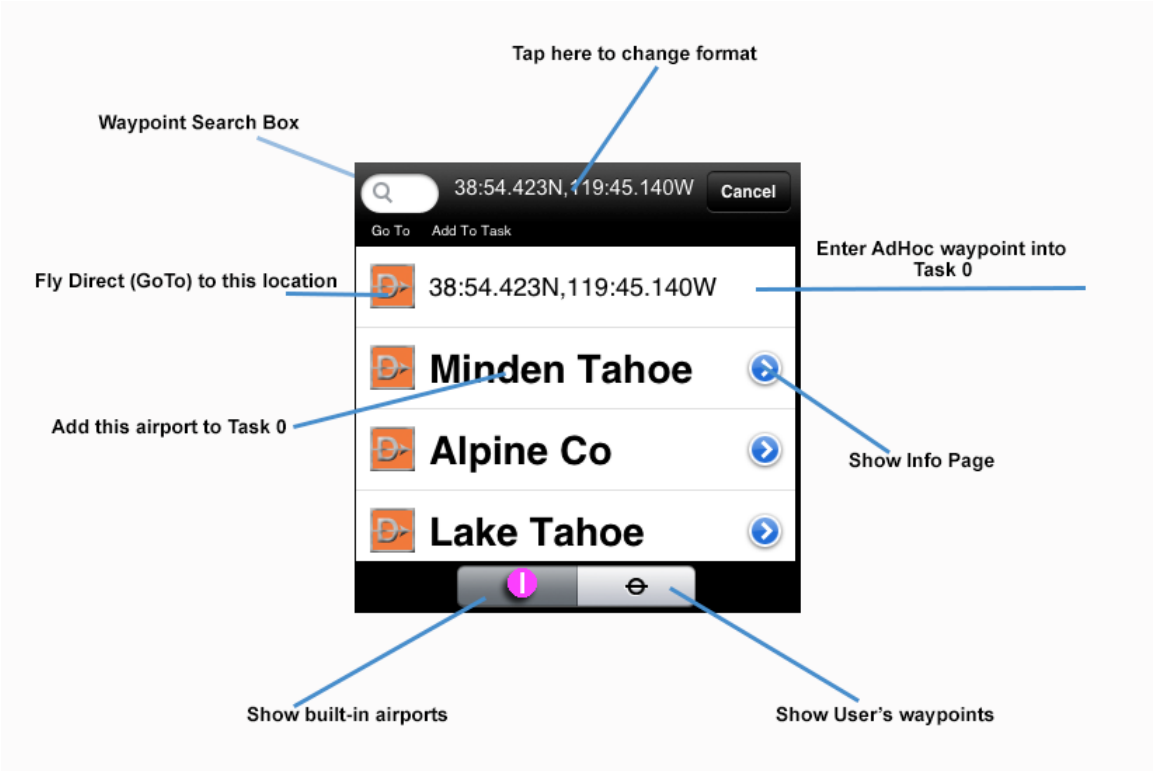
There are two main ways of editing a task: from the Task page, and from the Map screen.

Visual Task Editing

Starting with version 1.50 WinPilot offers task editing directly from the Map screen. Below is a tour explaining some features of the visual editing.

Adjusting the movable GoTo point

1. Tap anywhere on the screen. A dialog similar to this will appear:



2. Tap the image (not the text with coordinates) on the first entry in the dialog. This will create an Ad Hoc waypoint at the tapped location and engage the

Direct To, or Go To function to the selected location. If you want to edit or fine tune the location, tap at the end of the blue goto line to see the blue edit location circle:

This waypoint can be then moved on the map to any location – the final glide info will be updated automatically.

3. Press the green checkmark icon to place the waypoint on the map. Select the first row to leave it in the current location.

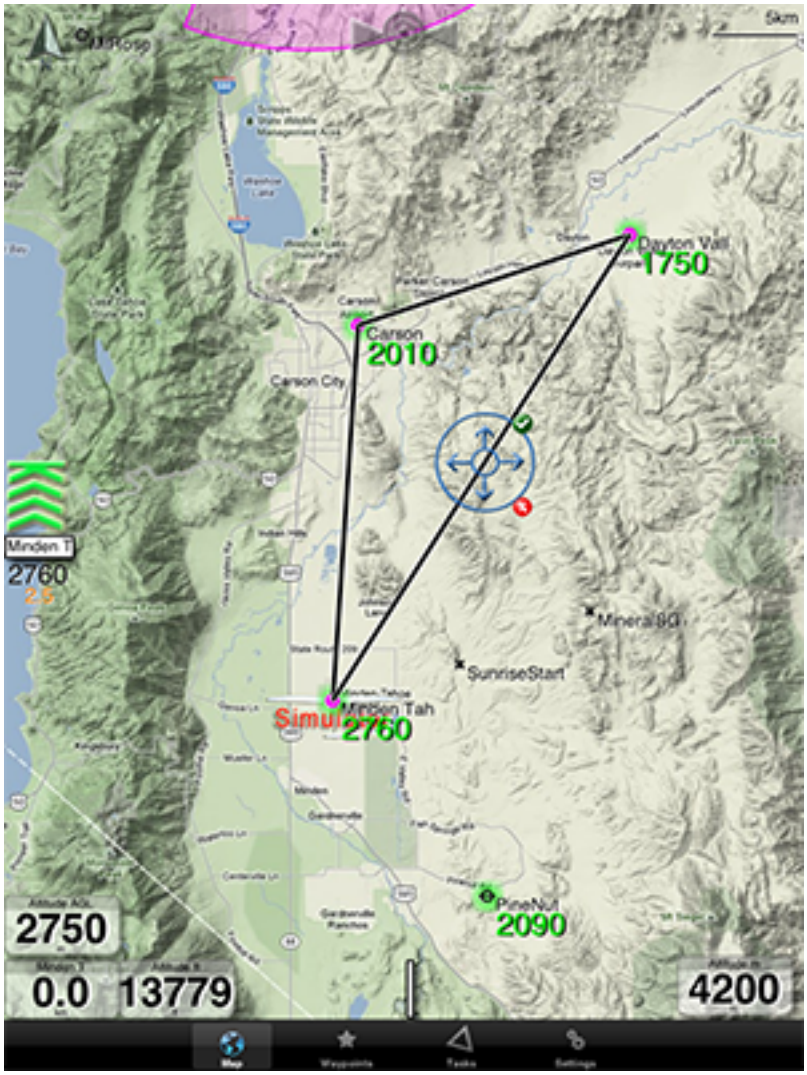
4. This is an Ad Hoc GoTo waypoint.
To remove this GoTo waypoint and disengage the GoTo function (ie perform Un-Goto), tap on the red X icon in the right lower corner of the blue circle.

Creating a task on the Map screen

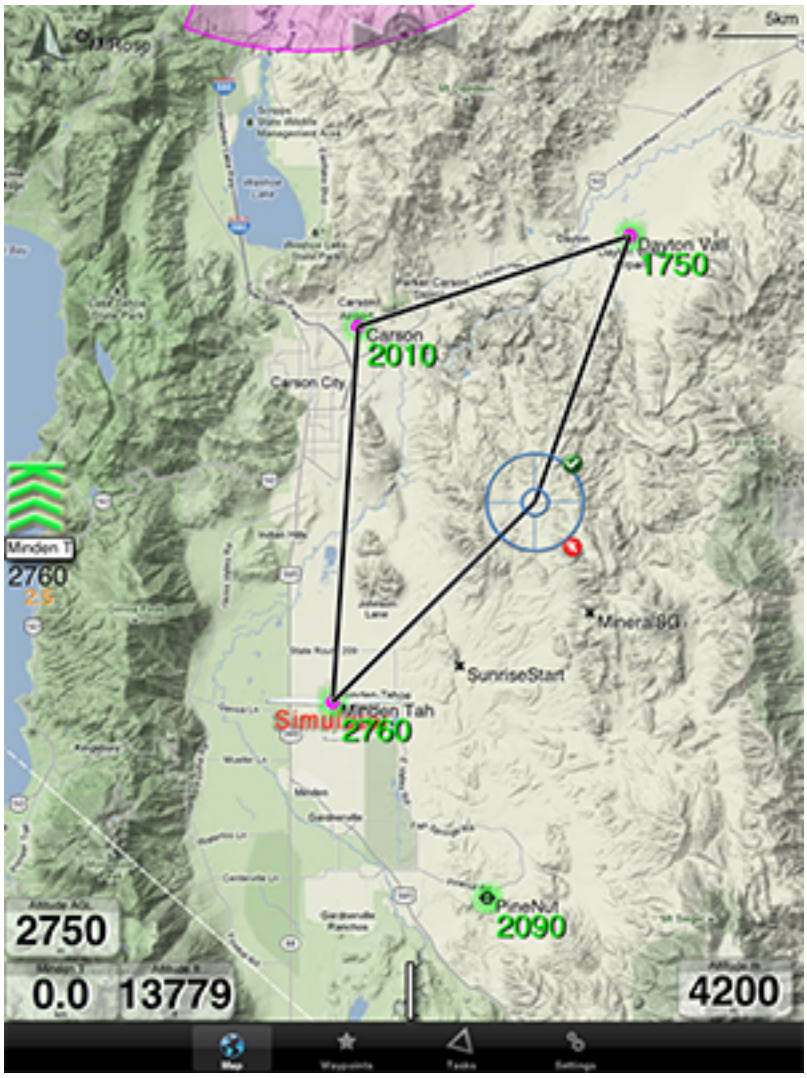
1. Tap anywhere on the screen to get the waypoint selection dialog (as in point 1 in previous exercise).
2. This time do not tap on the Direct-To icon image, but tap on the text. This will add either the selected Ad Hoc location, or selected airport to the task.
3. To remove an airport from the task, tap on its name on the map, and select 'Remove From Task'.

Inserting a new waypoint into an existing task leg

1. Tap on any of the legs of a shown task to get the blue edit circle:



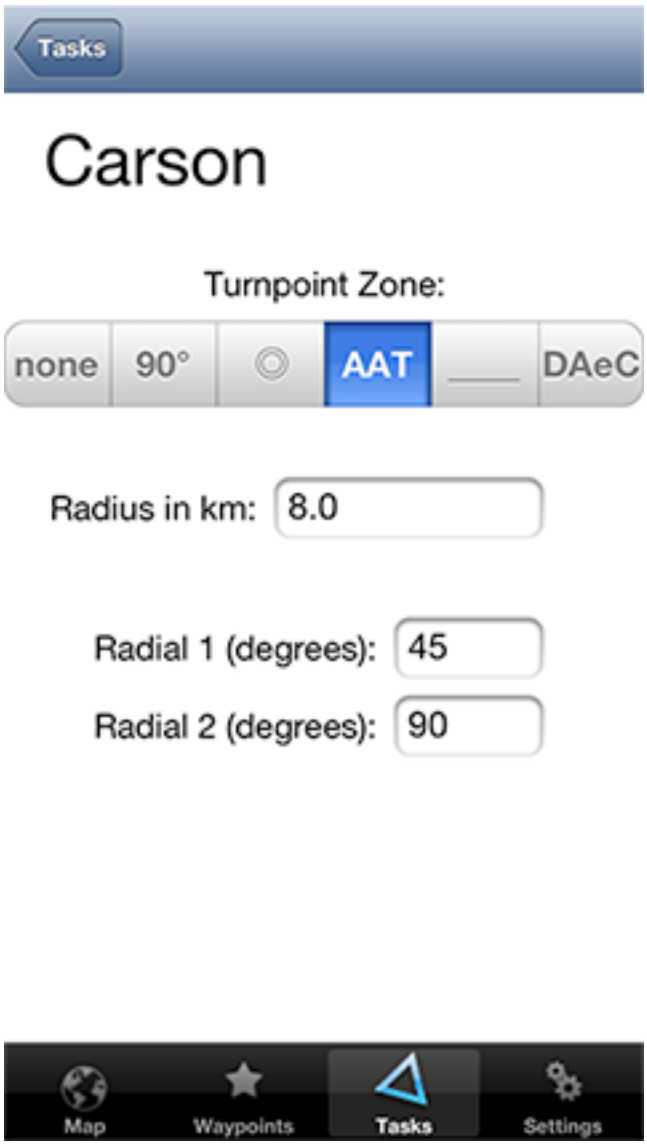
2. Move the circle around to the desired location:



3. Press the green OK icon to place it
4. That will pop up the 'Where to place it?' dialog allowing you to keep to place the new waypoint in the current location, or snap it to one the near by airports or user waypoints.

Setting Turnpoint Control Zones

To specify a zone for a given turnpoint, click on the name of the turnpoint in the upper pane of the Task Page. The following dialog appears:



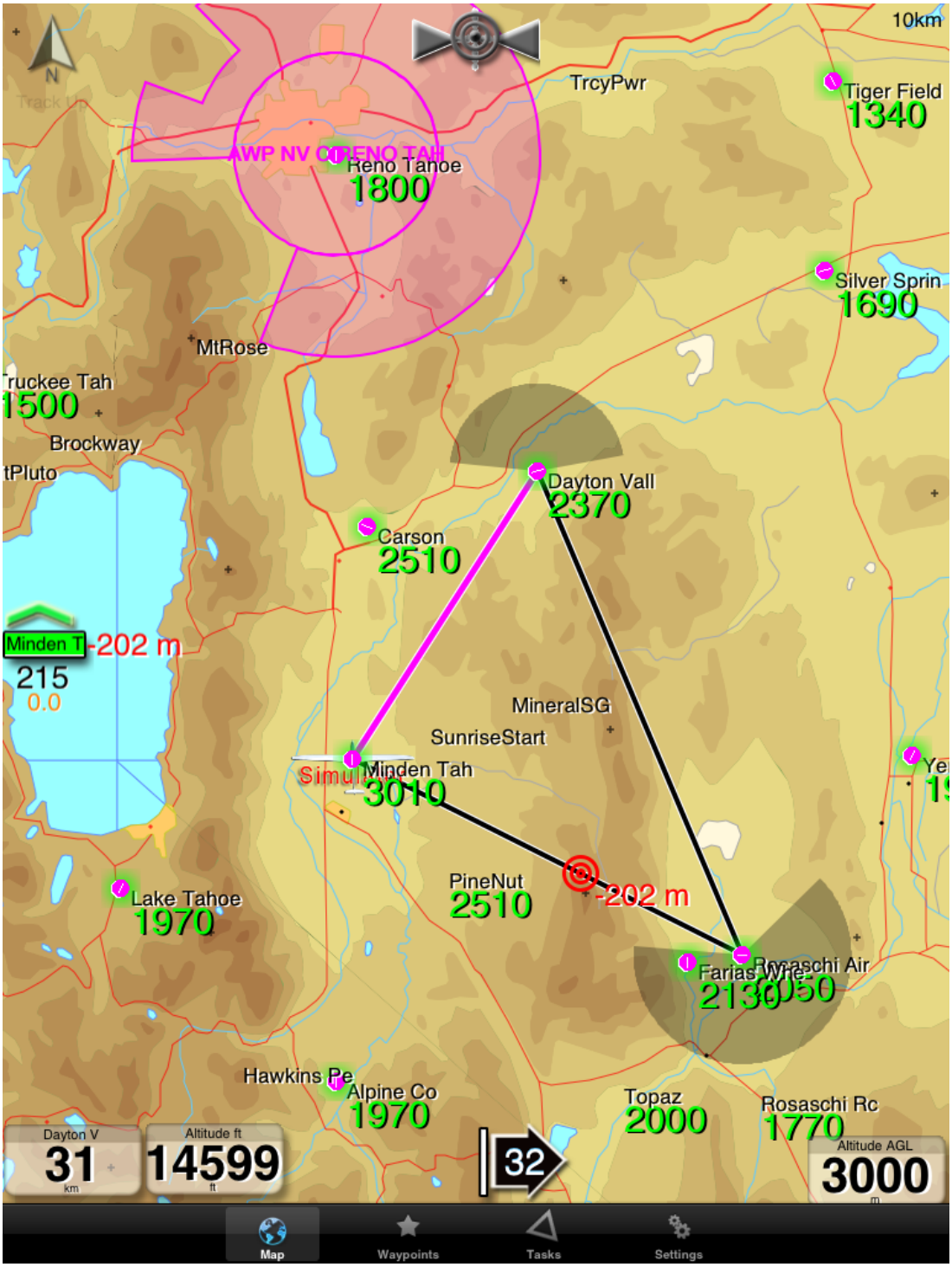
The available options are as follows:

- None – this turnpoint will have no control zone.
- 90 – 90 degrees FAI sector
- O – Cylliner control zone
- AAT – Area defined be radius and two radials
- ---- - Start or Finish line
- DAeC – DaeC sector

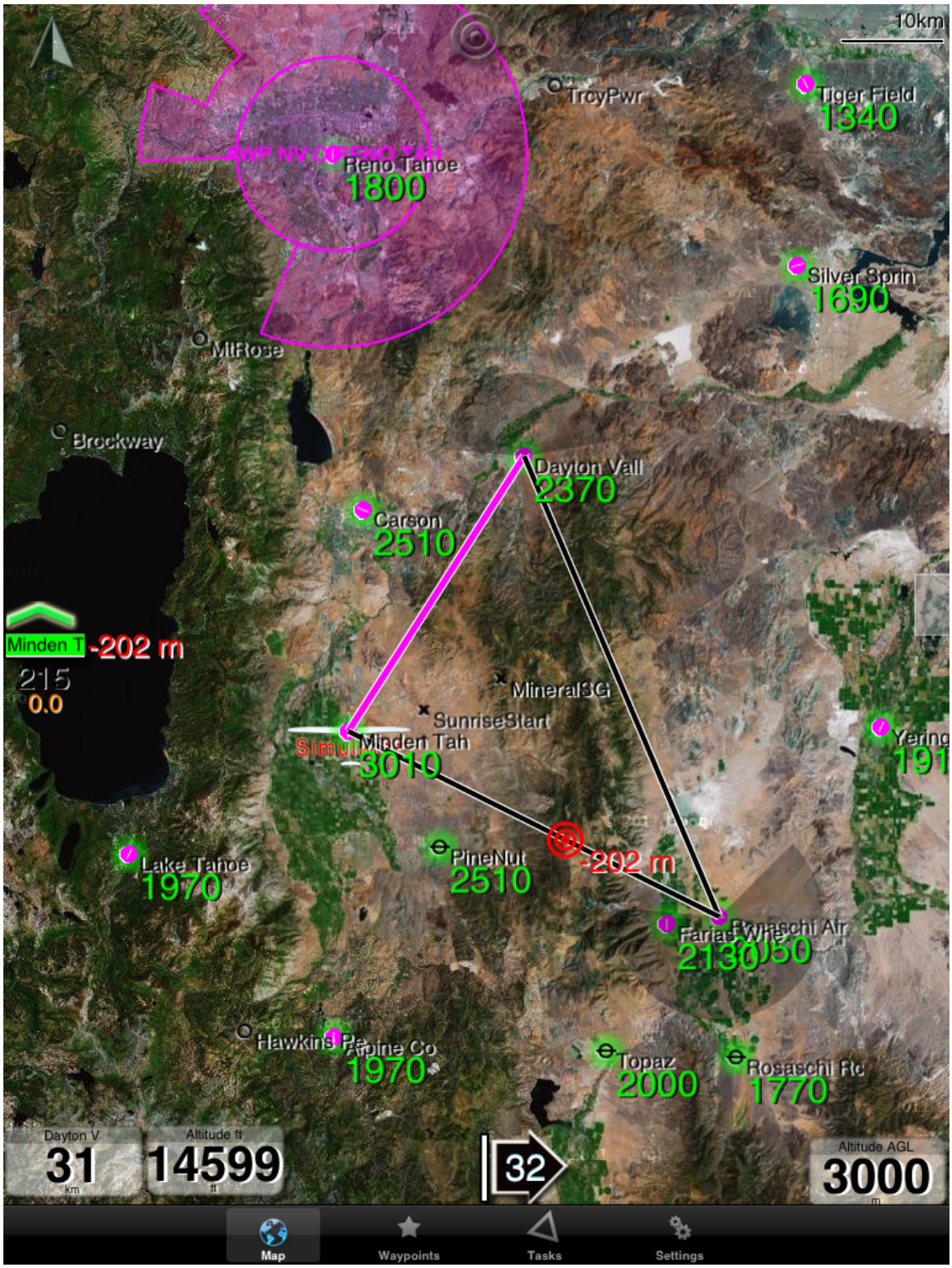
The Main Map Screen

The map screen can be in two modes: **Vector** or **Tiles**.

Vector Map Mode



Tile Map Mode



Vector Maps come preloaded with the software. To select a vector map for your country, go to Settings.Countries. Tile Maps need to be provided by the user (see: Tile Maps).

In addition to vector maps, also preloaded comes Airspace Data and Airport data, including runway dimensions and directions, terrain elevation data used in Final Glide Above Terrain and Altitude AGL NAvbox, and other airport information. This data might be not up to date, any and all information provided needs to be personally verified by the pilot before being used in any way.
The pilot has an option of disregarding all the provided info, and instead import his own Airspace and Airport data.

Tile Maps

Introduction

The 2013 version of WinPilot for iOS allows displaying tiles in Mercator projection as the base underlying map, instead of the vector map known from previous builds.

WinPilot itself does NOT download tiles from the Internet. The pilot can provide his own tiles from any available source, as long as they use Mercator projection, and follow the industry standard of addressing tiles that is used both by Microsoft maps and Google maps.

To see what tiles are needed, the option **Debug Tiles** in **Settings.Other.Tiles** should be enabled. That will display the name of the tile that WinPilot expects, as well as its Latitude and Longitude.

Alternatively, it is possible to use one of many sources of tiles available on the Internet, or some of the applications to download tiles, for example, www.allallsoft.com. We cannot and do not recommend using any particular method. Always read terms of service of the tile providers.

Installing Tile Maps

When WinPilot starts in Tile Map mode, the default zoom level is 10, so these tiles should be downloaded first. Each type of tile and zoom level should be in a separate zip file. That file should end with: underscore and zoom level.zip. For example, a file name gs_USA_11.zip means that this zip file contains tiles of type satellite for zoom level 11.

Tiles might come in form of zip files. Do NOT unzip these files yourself. These zip files need to be imported into the WinPilot Documents directory. It is possible to use iTunes (see chapter: Importing Files), but we recommend using a free utility called DiskAid from: http://www.digidna.net/diskaid , which is much faster than iTunes, especially when the iOS device contains a large number of files (tiles).

After the tile zip file is in the Document folder, the unzip process can be initiated by pressing **Check For New Tiles** in **Settings.Other.Tiles**.

When WinPilot starts in Tile mode, it scans the storage for all available tile types and zoom levels. This might take several seconds. When done, the information gathered is used to enable disable the gray zoom buttons on the right side of the map screen (see pictures below). If no tiles are available for a zoom level below or above the current zoom level, the corresponded zoom buttons will be hidden.

Enabling Tile Map mode

Switching between Tile Maps and Vector Map is done by in Settings by pressing the **Map Style** until it changes from Vector to Tiles.

Using Tile Maps

WinPilot has been designed for two different types of tiles to be loaded at the same time: terrain tiles (prefix t_), or satellite tiles (prefix gs_). This came about from realization that depending on the particular situation, a different type of tile can be best suited for the task. For example, when flying above mountains, a relief map provides a lot more useful data than the satellite map, but when flying close to a restricted airspace segment, or getting familiar with a new airport, a satellite map can be better.

To change what kind of tiles are shown on the Map, click the gray rectangle in the middle right part of the map, and select the tile icon below the gray zoom buttons.

Terrain Map

Satellite Map

Calculating Final Glide

The Map screen shows final glide calculations to all visible airports in the built-in database, as well as user turnpoints that are landable, considering current polar, water ballast, bugs, wind, altitude, and elevation of the target. See the top picture. Also shown is the currently flown **Task 0** (black lines), and the active leg of Task 0 (magenta line). Task turnpoint control zones are shown as a gray areas. The green chevrons on the left side of the screen show the final glide info to the next turnpoint. Each individual chevron symbolizes 5% of the final glide height needed. McCready settings, wind, and polar info are set on the Settings page.

The Chevrons on the left side show either final glide to home airport, or to Go To waypoint, or, when Task is active, to the final point of the task around all remaining waypoints.

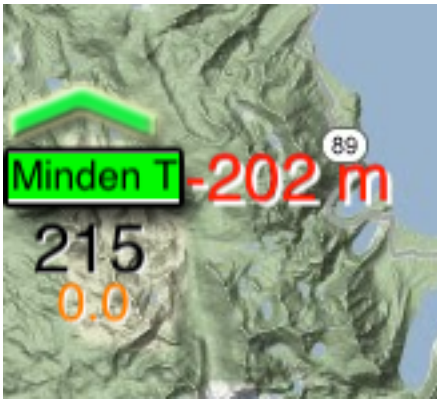
Adjusting McCready value

McCready can be by adjusted either on the Settings page, or on the map screen. To adjust it directly on the map (starting in version 1.51), tap the name of the waypoint in the Chevrons display to get this UI:

Final Glide Over Terrain

Starting with version 1.32, WinPilot is able to project the descent during the track the task route, and compare it with the terrain elevation database (DEM) along the route. This is done to detect a situation when final glide is achievable based solely on the current altitude of the glider, but because there is a terrain obstacle in a way (a mountain range), the goal is unreachable.
When WinPilot detects this type of situation, it will alert the pilot by showing a red concentric circle around the point on the map where the projected final glide descend path intersects the terrain the most:

If such a situation is detected, the main final glide indicator with Chevrons, will show a red number indicated altitude below terrain at which the final glide path intersects the mountain:



In the example above, the regular final glide calculator shows that the task destination (Minden) can be reached at 215m. However, the final glide over terrain calculator detected that the projected descent path will intersect the terrain to the depth of 202m. Therefore, to reach the goal, the pilot must climb at least 202m higher, plus any safety buffer for the errors in terrain database, and any other factors that the pilot should take into account.

Format Of WinPilot Files

Polar File

Name.plr

Here is a sample polar file (a * at the beginning of a line makes it a comment line):
*LS8 (15m) WinPilot POLAR file: MassDryGross[kg], MaxWaterBallast[liters], Speed1[km/h], Sink1[m/s], Speed2, Sink2, Speed3, Sink3
360, 180, 100,-0.67,155,-1.45,185,-2.5

Turnpoint file

Name.dat

WinPilot Turnpoint file for a given site should be comprised of entries in the following format:
Id, Latitude, Longitude, Elevation, Attribute, Name, Comment
where:

Id = turnpoint identifier (each turnpoint must have a different Id)
Latitude, Longitude: in one of the following formats (ss=seconds, dd = decimals):
dd:mm:ss (for example: 36:15:20N)
dd:mm.d (for example: 36:15.3N)
dd:mm.dd (for example: 36:15.33N)
dd:mm.ddd (for example: 36:15.333N)
followed by N,S,E,or W
Elevation – a number that can be followed by the letter 'F' if the elevation is in feet (if no letter is present it is assumed that elevation is given in meters), for example:
,1623F, – elevation is 1623 feet
,1623, - elevation is 1623 meters
Attribute: the following attributes are supported:
A = Airport,
T = Turnpoint,
L = Non-Airport Landing Point
S = Start, F=Finish, (not currently used),
M = Markpoint – a navpoint without an arrival cylinder drawn around it
H = Home (there must be one and only one turnpoint with attribute 'H' in the WinPilot.dat file, it is the default navigation target)
Name: Name of the waypoint, maximum 12 characters long
Comment: Additional description, maximum 12 characters long, shown at the bottom of the TP Arrow Nav Box, and on the pop-up waypoint labels.

Example of thext line describing Minden turnpoint:
16,39:00.000N,119:45.200W,4718F,ATH,Minden ,12/30 122.8

User Airspace file

Name.air (note that the extension is .air for the iOS version of WinPilot, and .txt for the older Windows CE versions).

```
*
*
•       AIRSPACE-related record types:
*       ==============================
*
*AC     class    ; where class can be:
R        restricted
Q        danger
P        prohibited
A        Class A
B        Class B
C        Class C
D        Class D
```

GP glider prohibited
CTR CTR
W Wave Window
AN string ;string = Airspace Name
AH string ;string = Airspace Ceiling
AL string ;string = Airspace Floor
AT coordinate;coordinate = Coordinate of where to place a name label on the map (optional)
NOTE: there can be multiple AT records for a single airspace segment
TERRAIN-related record types (NYI):
TO {string}; Declares Terrain Open Polygon; string = name (optional)
TC {string); Declares Terrain Closed Polygon; string = name (optional)
SP style, width, red, green, blue ; Selects Pen to be used in drawing
PEN STYLES in SP command:

SOLID	0
DASH	1
NULL (transparent)	5

Example: for a 1 pixel wide, dashed, light gray pen use: SP 0,1,192,192,192
SB red, green, blue ; Selects Brush Color to be used in drawing
Example: to select white interior of a closed polygon, use: SB 255, 255, 255
To select transparent interior use: SB -1,-1,-1
Record types common to both TERRAIN and AIRSPACE
V x=n ; Variable assignment.
Currently the following variables are supported:
D={+|-} sets direction for: DA and DB records
'-' means counterclockwise direction; '+' is the default; D is automatically reset to '+' at the begining of new airspace segment
X=coordinate : sets the center for the following records: DA, DB, and DC
Z=number ; makes the element invisible at zoom levels > number
T=1 ; transparent Airspace segment (draw border only)
DP coordinate ;add polygon point
DA radius, angleStart angleEnd ; add an arc, angles in degrees, radius in nm
DB coordinate1, coordinate2 ; add an arc, from coordinate1 to coordinate2
DC radius ; draw a circle (center taken from the previous V X record, radius in nm